JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 1, JULY 11, 2011

NEWS

In This Issue

2
- New Twist on cell migration
- Bak activators get in the groove
- SUMO defeats protein aggregates
  M. Leslie

In Focus

3
- The sarcoplasmic reticulum takes on a supporting role
  M. Leslie

People & Ideas

4
- Carol Dieckmann: An eye on organellar biology
  C. Sedwick

REVIEWS

Reviews

7 Signal transduction by reactive oxygen species
Toren Finkel

RESEARCH ARTICLES

Reports

17 The F-box protein Ppa is a common regulator of core EMT factors Twist, Snail, Slug, and Sip1
Rachel Lander, Kara Nordin, and Carole LaBonne

27 POM121 and Sun1 play a role in early steps of interphase NPC assembly
Jessica A. Talamas and Martin W. Hetzer

39 Transient binding of an activator BH3 domain to the Bak BH3-binding groove initiates Bak oligomerization
Haiming Dai, Alyson Smith, X. Wei Meng, Paula A. Schneider, Yuan-Ping Pang, and Scott H. Kaufmann

Articles

49 Sumoylation inhibits α-synuclein aggregation and toxicity
Petranka Krumova, Erik Meulmeester, Manuel Garrido, Marilyn Tirard, He-Hsuan Hsiao, Guillaume Bossis, Henning Urlaub, Markus Zweckstetter, Sebastian Kügler, Frauke Melchior, Mathias Bähr, and Jochen H. Weishaupt

61 Sorting of GPI-anchored proteins into ER exit sites by p24 proteins is dependent on remodeled GPI
Morihisa Fujita, Reika Watanabe, Nina Jaensch, Maria Romanova-Michaelides, Tadashi Satoh, Masaki Kato, Howard Riezman, Yoshiki Yamaguchi, Yusuke Maeda, and Taroh Kinoshita

77 Cargo sorting to lysosome-related organelles regulates siRNA-mediated gene silencing
Dinari A. Harris, Kevin Kim, Kenji Nakahara, Constanza Vásquez-Doorman, and Richard W. Carthew

89 α-Synuclein and ALPS motifs are membrane curvature sensors whose contrasting chemistry mediates selective vesicle binding
Iwona M. Pranke, Vincent Morello, Joëlle Bigay, Kimberley Gibson, Jean-Marc Verbavatz, Bruno Antonny, and Catherine L. Jackson

Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles related to the IN FOCUS feature have page numbers in BLUE.

On the cover

A transverse section through a mouse tibialis anterior muscle fiber shows that cytoplasmic γ-actin (green) and β2-spectrin (red) localize to the sarcoplasmic reticulum, which wraps around myofibrils (blue) and stores the calcium required for muscle contraction. Gokhin and Fowler reveal that cytoplasmic γ-actin is mislocalized in the absence of the actin-capping protein tropomodulin1, leading to impaired calcium release and myofibril misalignment.
Image courtesy of David Gokhin.
See page 105.

105 Cytoplasmic γ-actin and tropomodulin isoforms link to the sarcoplasmic reticulum in skeletal muscle fibers
David S. Gokhin and Velia M. Fowler

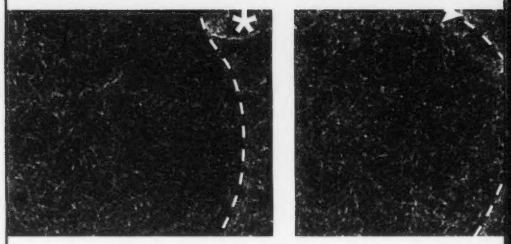
121 A PAR-1–dependent orientation gradient of dynamic microtubules directs posterior cargo transport in the *Drosophila* oocyte
Richard M. Parton, Russell S. Hamilton, Graeme Ball, Lei Yang, C. Fiona Cullen, Weiping Lu, Hiroyuki Ohkura, and Ilan Davis

137 Ipl1/Aurora-dependent phosphorylation of Sli15/INCENP regulates CPC–spindle interaction to ensure proper microtubule dynamics
Yuko Nakajima, Anthony Cormier, Randall G. Tyers, Adrianne Pigula, Yutian Peng, David G. Drubin, and Georjana Barnes

Corrections

155 Cbp3–Cbp6 interacts with the yeast mitochondrial ribosomal tunnel exit and promotes cytochrome *b* synthesis and assembly
Steffi Gruschke, Kirsten Kehrein, Katharina Römpler, Kerstin Gröne, Lars Israel, Axel Imhof, Johannes M. Herrmann, and Martin Ott

157 Aurora A kinase activity influences calcium signaling in kidney cells
Olga V. Plotnikova and Erica A. Golemis



In a wild-type *Drosophila* oocyte (left), microtubules (marked by EB1-GFP) fail to nucleate near the posterior cortex (dashed line), leading to a bias in microtubule polarity that aids the transport of mRNA to the cell rear. However, in the absence of PAR-1 (right), microtubules are nucleated throughout the oocyte, causing posterior mRNAs to mislocalize.
Image © 2011 Parton et al.
See page 121.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 2, JULY 25, 2011

NEWS

In This Issue

160 • AMPK amplifies Huntington's disease
• HJURP puts the centromere in place
• Sphingomyelinase helps bones get their minerals
B. Short

In Focus

161 • Microtubules follow septins' guidelines
B. Short

People & Ideas

162 • Rüdiger Klein: Reading the guideposts for axon guidance
C. Sedwick

REVIEWS

Reviews

165 Tracing the origins of centrioles, cilia, and flagella
Zita Carvalho-Santos, Juliette Azimzadeh, José. B. Pereira-Leal, and Mónica Bettencourt-Dias

RESEARCH ARTICLES

Reports

177 APC/C^{Cdh1}-dependent proteolysis of USP1 regulates the response to UV-mediated DNA damage
Xiomaris M. Cotto-Rios, Mathew J.K. Jones, Luca Busino, Michele Pagano, and Tony T. Huang

187 Septin GTPases spatially guide microtubule organization and plus end dynamics in polarizing epithelia
Jonathan R. Bowen, Daniel Hwang, Xiaobo Bai, Dheeraj Roy, and Elias T. Spiliotis

199 Repeated cleavage failure does not establish centrosome amplification in untransformed human cells
Anna Krzywicka-Racka and Greenfield Sluder

Articles

209 Nuclear translocation of AMPK-α1 potentiates striatal neurodegeneration in Huntington's disease
Tz-Chuen Ju, Hui-Mei Chen, Jiun-Tsai Lin, Ching-Pang Chang, Wei-Cheng Chang, Jheng-Jie Kang, Cheng-Pu Sun, Mi-Hua Tao, Pang-Hsien Tu, Chen Chang, Dennis W. Dickson, and Yijuang Chern

229 HJURP is a CENP-A chromatin assembly factor sufficient to form a functional de novo kinetochore
Meghan C. Barnhart, P. Henning J. L. Kuich, Madison E. Stellfox, Jared A. Ward, Emily A. Bassett, Ben E. Black, and Daniel R. Foltz

245 Preferential binding of a kinesin-1 motor to GTP-tubulin–rich microtubules underlies polarized vesicle transport
Takao Nakata, Shinsuke Niwa, Yasushi Okada, Franck Perez, and Nobutaka Hirokawa

257 High-resolution mapping reveals topologically distinct cellular pools of phosphatidylserine
Gregory D. Fairn, Nicole L. Schieber, Nicholas Ariotti, Samantha Murphy, Lars Kuerschner, Richard I. Webb, Sergio Grinstein, and Robert G. Parton

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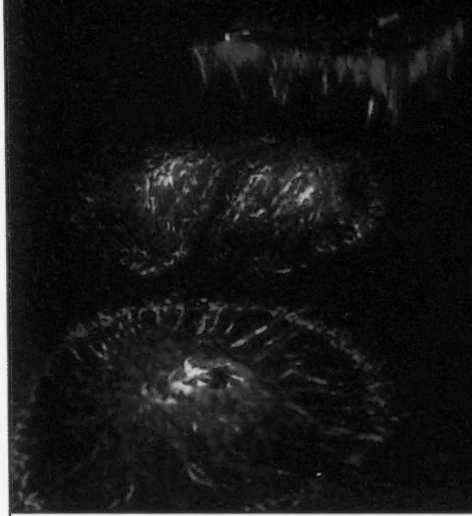


On the cover

Bowen et al. reveal that septin filaments (green) guide the reorganization of microtubules (red) as a flat MDCK cell (bottom) polarizes into a columnar epithelial layer (top).
Image courtesy of Jonathan Bowen.
See page 187.

277 A cell-autonomous requirement for neutral sphingomyelinase 2 in bone mineralization
Zohreh Khavandgar, Christophe Poirier, Christopher J. Clarke, Jingjing Li, Nicholas Wang, Marc D. McKee, Yusuf A. Hannun, and Monzur Murshed

291 Competitive binding of Rab21 and p120RasGAP to integrins regulates receptor traffic and migration
Anja Mai, Stefan Veltel, Teijo Pellinen, Artur Padzik, Eleanor Coffey, Varpu Marjomäki, and Johanna Ivaska

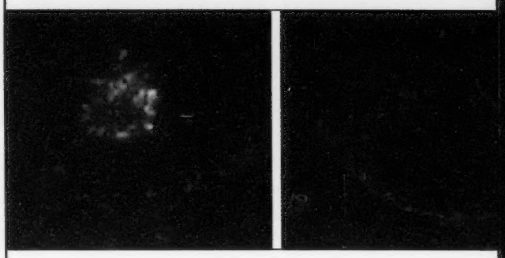
307 Osteoblast mineralization requires β1 integrin/ICAP-1–dependent fibronectin deposition
Molly Brunner, Angélique Millon-Frémillon, Genevieve Chevalier, Inaam A. Nakchbandi, Deane Mosher, Marc R. Block, Corinne Albigès-Rizo, and Daniel Bouvard

323 Neuroligins/LRRTMs prevent activity- and Ca^{2+}/calmodulin-dependent synapse elimination in cultured neurons
Jaewon Ko, Gilberto J. Soler-Llavina, Marc V. Fuccillo, Robert C. Malenka, and Thomas C. Südhof

335 STIM1L is a new actin-binding splice variant involved in fast repetitive Ca^{2+} release
Basile Darbellay, Serge Arnaudeau, Charles R. Bader, Stephane Konig, and Laurent Bernheim

Corrections

347 Global defects in collagen secretion in a *Mia3/TANGO1* knockout mouse
Deanna G. Wilson, Khanhky Phamluong, Li Li, Mei Sun, Tim C. Cao, Peter S. Liu, Zora Modrusan, Wendy N. Sandoval, Linda Rangell, Richard A.D. Carano, Andrew S. Peterson, and Mark J. Solloway



Fairn et al. map the distribution and topology of phosphatidylserine. The lipid (revealed by a red fluorescent reporter) is in the lumenal monolayer of early secretory pathway compartments but flips to the cytosolic face of the trans-Golgi network (green, left) and plasma membrane (green, right).
Image © 2011 Fairn et al.
See page 257.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 3, AUGUST 8, 2011

NEWS

In This Issue

350 • PARP retains Ku at double-strand breaks
• RNA targeting gets competitive
• A COG in the retrograde transport machinery
B. Short

In Focus

351 • Nuclear envelope starts with a clean sheet
B. Short

People & Ideas

352 • Ulrike Eggert: Big things from small molecules
C. Sedwick

REVIEWS

Reviews

355 Cellular mechanisms of cardiomyopathy
Pamela A. Harvey and Leslie A. Leinwand

RESEARCH ARTICLES

Reports

367 PARP regulates nonhomologous end joining through retention of Ku at double-strand breaks
C. Anne-Marie Couto, Hong-Yu Wang, Joanna C.A. Green, Rhian Kiely, Robert Siddaway, Christine Borer, Catherine J. Pears, and Nicholas D. Lakin

377 Visualization of dynein-dependent microtubule gliding at the cell cortex: implications for spindle positioning
Eva M. Gusnowski and Martin Srayko

387 The mitochondrial import protein Mim1 promotes biogenesis of multispanning outer membrane proteins
Thomas Becker, Lena-Sophie Wenz, Vivien Krüger, Waltraut Lehmann, Judith M. Müller, Luise Goroncy, Nicole Zufall, Trevor Lithgow, Bernard Guiard, Agnieszka Chacinska, Richard Wagner, Chris Meisinger, and Nikolaus Pfanner

397 Multispan mitochondrial outer membrane protein Ugo1 follows a unique Mim1-dependent import pathway
Dražen Papić, Katrin Krumpe, Jovana Dukanovic, Kai S. Dimmer, and Doron Rapaport

Articles

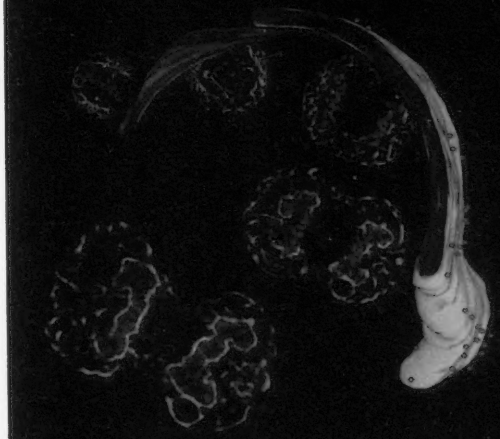
407 Rb and p130 control cell cycle gene silencing to maintain the postmitotic phenotype in cardiac myocytes
Patima Sdek, Peng Zhao, Yaping Wang, Chang-jiang Huang, Christopher Y. Ko, Peter C. Butler, James N. Weiss, and W. Robb MacLellan

425 Formation of the postmitotic nuclear envelope from extended ER cisternae precedes nuclear pore assembly
Lei Lu, Mark S. Ladinsky, and Tomas Kirchhausen

441 Spatial code recognition in neuronal RNA targeting: Role of RNA–hnRNP A2 interactions
Ilham A. Muslimov, Mihir V. Patel, Arthur Rose, and Henri Tiedge

459 The COG complex interacts directly with Syntaxin 6 and positively regulates endosome-to-TGN retrograde transport
Orly Laufman, WanJin Hong, and Sima Lev

Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles related to the IN FOCUS feature have page numbers in BLUE.



On the cover

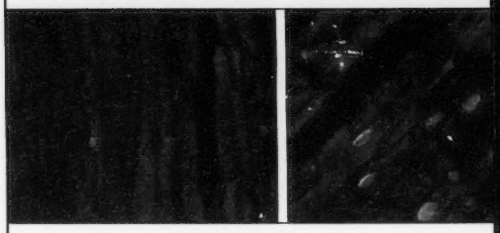
Lu et al. describe how the nuclear envelope forms directly from ER cisternae before nuclear pore complexes reassemble after mitosis. In a time series of confocal micrographs, the ER (green) progressively envelopes separating chromosomes (red). The electron tomographic model shows an ER cisternae (green) contacting the surface of mitotic chromosomes (blue), where it forms the outer and inner nuclear membranes. Image courtesy of Lu et al.
See page 425.

473 The myosin-related motor protein Myo2 is an essential mediator of bud-directed mitochondrial movement in yeast
Johannes Förtsch, Eric Hummel, Melanie Krist, and Benedikt Westermann

489 FGF and retinoic acid activity gradients control the timing of neural crest cell emigration in the trunk
Patricia L. Martínez-Morales, Ruth Diez del Corral, Isabel Olivera-Martínez, Alejandra C. Quiroga, Raman M. Das, Julio A. Barbas, Kate G. Storey, and Aixa V. Morales

Corrections

505 REST/NRSF governs the expression of dense-core vesicle gliosecretion in astrocytes
Ilaria Prada, Julie Marchaland, Paola Podini, Lorenzo Magrassi, Rosalba D'Alessandro, Paola Bezzi, and Jacopo Meldolesi



Sdek et al. demonstrate that Rb proteins maintain the postmitotic state of adult cardiomyocytes by recruiting heterochromatin proteins to silence proliferation-promoting genes. Compared to control tissue (left), adult cardiac muscle (red) lacking the Rb family members Rb and p130 (right) shows increased numbers of proliferative nuclei (green). Image © 2011 Sdek et al.
See page 407.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 4, AUGUST 22, 2011

NEWS

In This Issue

508 • RanBP2 stops importin-β from running away
• Lis1 finds new digs on the desmosome
• Switching adherens junctions to seal wounds
M. Leslie

In Focus

509 • Aurora B goes the distance
M. Leslie

People & Ideas

510 • Alejandro Sánchez Alvarado: Bootstrapping flatworms into the molecular age
C. Sedwick

REVIEWS

Reviews

513 The evolution of the cytoskeleton
Bill Wickstead and Keith Gull

RESEARCH ARTICLES

Reports

527 The DExD/H box ATPase Dhh1 functions in translational repression, mRNA decay, and processing body dynamics
Johanna S. Carroll, Sarah E. Munchel, and Karsten Weis

539 Aurora B dynamics at centromeres create a diffusion-based phosphorylation gradient
Enxiu Wang, Edward R. Ballister, and Michael A. Lampson

Articles

551 The histone methyltransferase Set7/9 promotes myoblast differentiation and myofibril assembly
Yazhong Tao, Ronald L. Neppl, Zhan-Peng Huang, Jianfu Chen, Ru-Hang Tang, Ru Cao, Yi Zhang, Suk-Won Jin, and Da-Zhi Wang

567 Wee1 controls genomic stability during replication by regulating the Mus81-Eme1 endonuclease
Raquel Domínguez-Kelly, Yusé Martín, Stephane Koundrioukoff, Marvin E. Tanenbaum, Veronique A.J. Smits, René H. Medema, Michelle Debatisse, and Raimundo Freire

581 c-Jun N-terminal kinase phosphorylates DCP1a to control formation of P bodies
Katharina Rzeczkowski, Knut Beuerlein, Helmut Müller, Oliver Dittrich-Breiholz, Heike Schneider, Daniela Kettner-Buhrow, Helmut Holtmann, and Michael Kracht

597 Ran-dependent docking of importin-β to RanBP2/Nup358 filaments is essential for protein import and cell viability
Masakazu Hamada, Anna Haeger, Karthik B. Jeganathan, Janine H. van Ree, Liviu Malureanu, Sarah Wälde, Jomon Joseph, Ralph H. Kehlenbach, and Jan M. van Deursen

613 Actomyosin II contractility expels von Willebrand factor from Weibel–Palade bodies during exocytosis
Thomas D. Nightingale, Ian J. White, Emily L. Doyle, Mark Turmaine, Kimberly J. Harrison-Lavoie, Kathleen F. Webb, Louise P. Cramer, and Daniel F. Cutler

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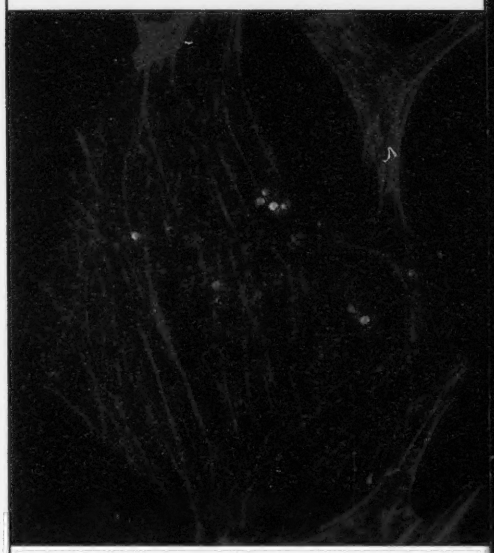
On the cover

Wang et al. describe how a diffusion-based gradient of Aurora B phosphorylation spreads outward from centromeres (right image, red). In this monopolar mitotic cell, the gradient is revealed by a FRET-based biosensor targeted to chromatin (right image, green), where blue indicates high phosphorylation levels and yellow indicates lower Aurora B activity (left image).
Image courtesy of Enxiu Wang.
See page 539.

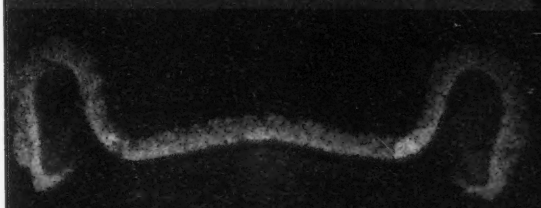
631 Lis1 is essential for cortical microtubule organization and desmosome stability in the epidermis
Kaelyn D. Sumigray, Hsin Chen, and Terry Lechler

643 Mechanosensitive EPLIN-dependent remodeling of adherens junctions regulates epithelial reshaping
Katsutoshi Taguchi, Takashi Ishiuchi, and Masatoshi Takeichi



Nightingale et al. reveal how the actin cytoskeleton (green) helps to squeeze von Willebrand factor (red) out of Weibel-Palade bodies during regulated exocytosis.
Image © 2011 Nightingale et al.
See page 613.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 5, SEPTEMBER 5, 2011



On the cover

A vertical cross-section through a three-day-old colony of an undomesticated *S. cerevisiae* strain reveals its complex, differentiated structure. Galactose in the underlying agar induces the expression of green fluorescent protein in the outermost cell layers but fails to reach interior cells (which only show red autofluorescence) due to the presence of a selectively permeable extracellular matrix. Image courtesy of Váchová et al.
See page 679.

NEWS

In This Issue

658 • Vpr loosens chromatid ties
• DLK makes neuronal cutbacks
• Arf1 doubles up to release vesicles
B. Short

In Focus

659 • Budding yeast star in their own biofilm
B. Short

People & Ideas

660 • Ruth Lehmann: Germ cells do things differently
C. Sedwick

Editorials

663 New Tools for *JCB*
Elizabeth H. Williams and Tom Misteli

REVIEWS

Comments

665 Bringing Rad52 foci into focus
Peter H. Thorpe, David Alvaro, Michael Lisby, and Rodney Rothstein

Reviews

669 Cytoskeleton in motion: the dynamics of keratin intermediate filaments in epithelia
Reinhard Windoffer, Michael Beil, Thomas M. Magin, and Rudolf E. Leube

RESEARCH ARTICLES

Reports

679 Flo11p, drug efflux pumps, and the extracellular matrix cooperate to form biofilm yeast colonies
Libuše Váchová, Vratislav Šťovíček, Otakar Hlaváček, Oleksandr Chernyavskiy, Luděk Štěpánek, Lucie Kubínová, and Zdena Palková

Articles

689 The nucleolus directly regulates p53 export and degradation
Mark T. Boyd, Nikolina Vlatković, and Carlos P. Rubbi

705 Cdk1 uncouples CtIP-dependent resection and Rad51 filament formation during M-phase double-strand break repair
Shaun E. Peterson, Yinyin Li, Brian T. Chait, Max E. Gottesman, Richard Baer, and Jean Gautier

721 Epigenetic displacement of HP1 from heterochromatin by HIV-1 Vpr causes premature sister chromatid separation
Mari Shimura, Yusuke Toyoda, Kenta Iijima, Masanobu Kinomoto, Kenzo Tokunaga, Kinya Yoda, Mitsuhiro Yanagida, Tetsutaro Sata, and Yukihito Ishizaka

737 Mindbomb 1, an E3 ubiquitin ligase, forms a complex with RYK to activate Wnt/β-catenin signaling
Jason D. Berndt, Atsushi Aoyagi, Peitzu Yang, Jamie N. Anastas, Lan Tang, and Randall T. Moon

751 DLK induces developmental neuronal degeneration via selective regulation of proapoptotic JNK activity
Arundhati Sengupta Ghosh, Bei Wang, Christine D. Pozniak, Mark Chen, Ryan J. Watts, and Joseph W. Lewcock

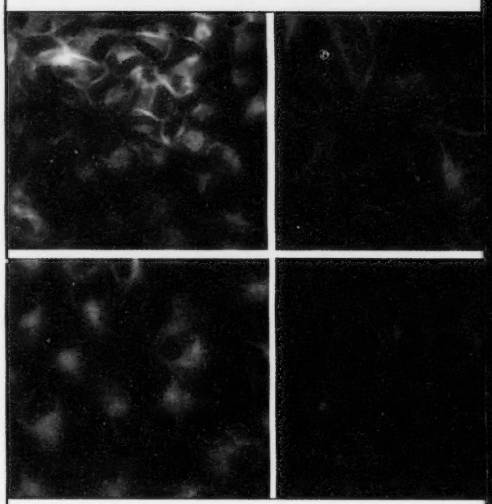
Articles with related stories in the IN THIS ISSUE section have page numbers in RED; articles related to the IN FOCUS feature have page numbers in BLUE.

765 Coatomer and dimeric ADP ribosylation factor 1 promote distinct steps in membrane scission
Rainer Beck, Simone Prinz, Petra Diestelkötter-Bachert, Simone Röhling, Frank Adolf, Kathrin Hoehner, Sonja Welsch, Paolo Ronchi, Britta Brügger, John A.G. Briggs, and Felix Wieland

779 GCC185 plays independent roles in Golgi structure maintenance and AP-1–mediated vesicle tethering
Frank C. Brown, Carmel H. Schindelhaim, and Suzanne R. Pfeffer

Tools

789 Comparative RNAi screening identifies a conserved core metazoan actinome by phenotype
Jennifer L. Rohn, David Sims, Tao Liu, Marina Fedorova, Frieder Schöck, Joseph Dopie, Maria K. Vartiainen, Amy A. Kiger, Norbert Perrimon, and Buzz Baum



Rohn et al. perform genome-wide RNAi screens in both *Drosophila* and human cells for regulators of the actin cytoskeleton. The top left panel shows F-actin (red) in control HeLa cells. Actin organization is perturbed in the absence of the E3 ubiquitin ligase RBX1 (top right), the formin FMNL1 (bottom left) and the putative splicing factor BUD31 (bottom right). Labeling for α-tubulin (green) and DNA (blue) are also shown.
Image © 2011 Rohn et al.
See page 789.

JCB
THE JOURNAL OF CELL BIOLOGY
VOL. 194, NO. 6, SEPTEMBER 19, 2011

NEWS

In This Issue

808 • p63 delegates during skin development
• MCPH1 keeps chromosomes strung out
• A kinase makes a connection
M. Leslie

In Focus

809 • Mnemonic microRNAs help make memories
M. Leslie

People & Ideas

810 • Shinya Inoué: Lighting the way in microscopy
C. Sedwick

Editorials

813 New editorial board members

REVIEWS

Reviews

815 TOR kinase complexes and cell migration
Lunhua Liu and Carole A. Parent

RESEARCH ARTICLES

Articles

825 p63 regulates *Satb1* to control tissue-specific chromatin remodeling during development of the epidermis
Michael Y. Fessing, Andrei N. Mardaryev, Michal R. Gdula, Andrey A. Sharov, Tatyana Y. Sharova, Valentina Rapisarda, Konstantin B. Gordon, Anna D. Smorodchenko, Krzysztof Poterlowicz, Giustina Ferone, Yoshinori Kohwi, Caterina Missero, Terumi Kohwi-Shigematsu, and Vladimir A. Botchkarev

841 MCPH1 regulates chromosome condensation and shaping as a composite modulator of condensin II
Daisuke Yamashita, Keishi Shintomi, Takao Ono, Ioannis Gavvovidis, Detlev Schindler, Heidemarie Neitzel, Marc Trimborn, and Tatsuya Hirano

855 CENP-C recruits M18BP1 to centromeres to promote CENP-A chromatin assembly
Ben Moree, Corey B. Meyer, Colin J. Fuller, and Aaron F. Straight

873 Arf6 regulates AP-1B–dependent sorting in polarized epithelial cells
Elina Shteyn, Lucy Pigati, and Heike Fölsch

889 Targeting of the Arpc3 actin nucleation factor by miR-29a/b regulates dendritic spine morphology
Giordano Lippi, Joern R. Steinert, Emma L. Marczylo, Sabina D'Oro, Roberto Fiore, Ian D. Forsythe, Gerhard Schratt, Michele Zoli, Pierluigi Nicotera, and Kenneth W. Young

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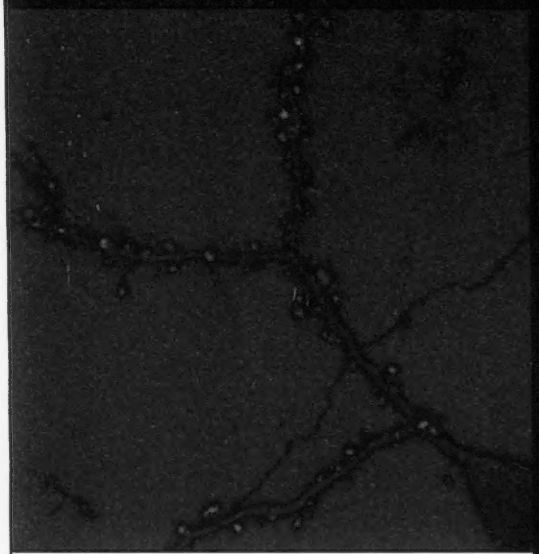
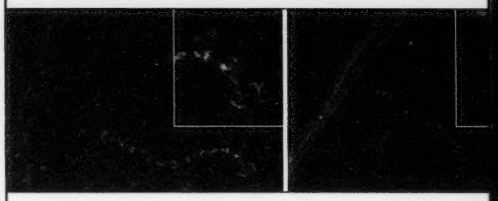


On the cover

A mouse hippocampal neuron (red) shows numerous mushroom-shaped dendritic spines enriched in PSD-95 (green) along its dendrites. Lippi et al. reveal that the morphology of these structures is modulated by the expression of miRNAs that target the Arpc3 actin-nucleation factor.
Image courtesy of Kenneth Young.
See page 889.

905 GRK5 promotes F-actin bundling and targets bundles to membrane structures to control neuronal morphogenesis
Yuejun Chen, Feifei Wang, Hui Long, Ying Chen, Ziyan Wu, and Lan Ma

921 S6 kinase localizes to the presynaptic active zone and functions with PDK1 to control synapse development
Ling Cheng, Cody Locke, and Graeme W. Davis



Cheng et al. reveal that S6 kinase localizes to presynaptic active zones, where it regulates synapse development. Although neuromuscular junctions from flies lacking S6 kinase (right) have similar numbers of presynaptic boutons (green) compared to wild-type flies (left), the boutons are smaller in size and have fewer sites of neurotransmitter release. Neuron membranes are labeled magenta. Image © 2011 Cheng et al.
See page 921.